

Remarks

Claims 1-3, 5-11, 13-28 and 32-41 are pending in this application. Claims 22-28 and 32-35 stand rejected under 35 U.S.C. 102(b) as being anticipated by Szeliski et al., U.S. pat. no. 6,157,747, hereinafter referred to as "Szeliski '747." Claims 1-3, 5-6, and 8-10, stand rejected under 35 U.S.C. 103(a) as being unpatentable over Szeliski '747 in view of Luken (U.S. pat. no. 5,923,334). Claims 11 and 36 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Szeliski '747 in view of Seago (U.S. pat. no. 5,990,900). Claim 7 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Szeliski '747 in view of Luken, and in further view of Blank (US pat. no. 5,469,536). Claims 13-21 and 37 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Szeliski '747 in view of Seago and in further view of Blank '536.

A request for continued examination under 37 C.F.R. §1.114 is filed herewith.

Claims 1, 11, 22, 32, 36 and 38 have been amended to require that creating a three dimensional model includes identifying at least one boundary of an object being modeled and using the identified boundary to associate geometry information with the object where the geometry information includes the position and orientation of the boundary. This limitation is taught at least in paragraphs 99-103 and figs. 28-34 of the subject application, where the walls of a room in the input panoramas include the boundary of the intersection of the base of the walls with the floor. Support for new claims 39-

41 is provided at least in the same portions of the specification. No new matter has been added.

Claim Rejections – 35 U.S.C § 102(b)

Claims 22-28 and 32-35 stand rejected under 35 U.S.C. 102(b) as being anticipated by Szeliski et al., U.S. pat. no. 6,157,747.

Claims 22 and 32, as amended, require a geometric modeling step which includes identifying a boundary of an object within the panorama. This identified boundary is then used to associate geometric information with the object including 3-D coordinates describing the position and orientation of the object boundary in a reference coordinate system. This modeling step distinguishes Claims 22 and 32 from the teachings of Szeliski '747 because Szeliski '747 does not teach, disclose or suggest identifying an object within a panorama by any means including identifying a boundary of the object. Further, Szeliski '747 does not teach or suggest using an identified boundary of the object to associate geometric information with the object. Instead, Szeliski teaches creating a mosaic of images and

“...mapping the mosaic onto an arbitrary texture-mapped polyhedron surrounding the origin, the virtual environment can be viewed or explored using standard 3D graphics viewers and hardware without requiring special-purpose players.” (See, Szeliski '747, col. 5, lines 15-20.)

It is clear that Szeliski '747 does not teach individually modeling objects within the images, as required by Claims 22 and 32, as amended. Szeliski drapes the image mosaic over an arbitrary polyhedron without identifying any object.

Claim 22, as amended requires, in part:

“...creating a geometric model of the image panorama based at least in part on the three-dimensional geometric surface and the directional vector, wherein creating a geometric model includes identifying at least one boundary of the object and using the identified boundary to associate geometry information with the object, the geometry information comprising 3-D coordinates describing the position and orientation of the object boundary in a reference coordinate system; and applying the one or more textures to the object in the image panorama based on the geometric model. “

Clearly, Szeliski ‘747 does not teach or suggest identifying a boundary of an object within the panorama and using the identified object boundary to model the object. Because Szeliski ‘747 does not teach at least these required limitations of Claims 22 and 32, as amended, Szeliski ‘747 cannot anticipate these claims. Claims 23-28 and 33-35 depend from Claims 22 and 32, respectively, and add further limitations. Therefore, Claims 23-28 and 33-35 are deemed not anticipated by Szeliski ‘747 for at least the same reasons as for Claims 22 and 32.

Claim Rejections – 35 U.S.C § 103(a)

A. Claims 1-3, 5-6, and 8-10, stand rejected under 35 U.S.C. 103(a) as being unpatentable over Szeliski '747 in view of Luken '334.

The rejection of Claims 1-3, 5-6, and 8-10 under 35 U.S.C. 103(a) as being obvious over Szeliski '747 in view of Luken '334 lacks a prima facie case of obviousness because neither of the references teaches, discloses or suggests creating a geometric model of an object within a panorama by identifying a boundary of the object and using the identified boundary of the object to associate geometric information with the object.

As shown above, Szeliski '747 does not teach the object modeling steps of Claim 1, as amended, which are analogous to the object modeling steps of Claim 22. Further, Luken '334 does not teach creating 3D objects within a scene, at all. Because neither Szeliski '747 nor Luken '334 teaches, discloses or suggests modeling an object within a panorama by identifying a boundary of the object and using the identified boundary of the object to associate geometric information with the object, a prima facie case of obviousness is lacking and Claim 1 is deemed nonobvious over any combination of Szeliski '747 and Luken '334. Claims 2-3, 5-6, and 8-10 depend from Claim 1 and add further limitations and are deemed nonobvious over Szeliski '747 in view of Luken '334 for at least the same reasons as for Claim 1.

B. Claims 11 and 36 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Szeliski '747 in view of Seago '900.

The rejection of Claims 11 and 36, as amended, under 35 U.S.C. 103(a) as being unpatentable over Szeliski '747 in view of Seago '900 lacks a prima facie case of obviousness because neither of the references teaches, discloses or suggests modeling an object within a panorama by identifying a boundary of the object and using the identified boundary of the object to associate geometric information with the object, where the object occupies a field of view greater than 180 degrees.

Claim 11, as amended, requires (in part):

“...creating a three dimensional model of the visual scene using features of the visual scene and the point source, wherein creating a three dimensional model includes identifying at least one boundary of the object and using the identified boundary to associate geometry information with the object, the geometry information comprising 3-D coordinates describing the position and orientation of the object boundary in a reference coordinate system...”

The Office Action relies on Szeliski '747 for teaching the limitations of Claims 11 and 36 that are analogous to the limitations cited above for Claim 22. As shown above for Claim 22, Szeliski '747 does not teach at least the step of “identifying at least one boundary of the object and using the identified boundary to associate geometry information with the object.”

Seago '900 does not teach modeling an object at all where the object occupies a field of view greater than 180 degrees. The input to Seago's method is a 2-D perspective image or a group of 2-D images displaying the object to be modeled. (See, e.g., Seago '900, col. 11, lines 45-47). Seago determines vanishing points for the planar faces of the object using parallel lines on the object and then derives a 3D coordinate system for the object using the vanishing points. (See, Seago, steps 40 to 48, fig. 2.) The features of the object are then modeled (See, Seago, step 50, fig. 2 and figs. 9-10.) The object to be modeled, therefore, must "fit" onto a display surface in Seago's screen world coordinate space, so that the vanishing points for the object can be calculated, the coordinate system determined and the features of the object determined in the coordinate system. Seago's object in the image(s) must occupy a field of view of no more than 180 degrees so that it can be viewed on the display screen. Therefore, Seago's method is inapplicable to objects that occupy a field of view of more than 180 degrees.

Therefore, a prima facie case of obviousness is lacking for Claims 11 and 36 for the combination of Szeliski '747 and Seago '900. Thus, Claims 11 and 36 are deemed non-obvious over Szeliski '747 in view of Seago '900.

C. Claim 7 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Szeliski '747, in view of Luken '334 and Blank '536.

The rejection of Claim 7 under 35 U.S.C. 103(a) as being obvious over Szeliski '747 in view of Luken '334 and Blank '536 lacks a prima facie case of obviousness because none of the references teaches, discloses or suggests creating a geometric model of an object within a panorama by identifying a boundary of the object and using the identified boundary of the object to associate geometric information with the object.

As shown above, Szeliski '747 does not teach the object modeling steps of Claim 1, as amended, which are analogous to the object modeling steps of Claim 22. Further, Luken '334 does not teach creating 3D objects within a scene, at all. Likewise, Blank '536 teaches editing 2D images and does not teach creating 3D objects within a scene. Because neither Szeliski '747 nor Luken '334 nor Blank '536 teaches, discloses or suggests modeling an object within a panorama by identifying a boundary of the object and using the identified boundary of the object to associate geometric information with the object, a prima facie case of obviousness is lacking and Claim 7 is deemed nonobvious over any combination of Szeliski '747, Luken '334 and Blank '536.

D. Claims 13-21 and 37 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Szeliski '747, in view of Seago '900, and in further view of Blank '536.

The rejection of Claims 13-21 and 37 under 35 U.S.C. 103(a) as being obvious over Szeliski '747 in view of Seago '900 and Blank '536 lacks a prima

facie case of obviousness because none of the references teaches, discloses or suggests modeling an object within a panorama by identifying a boundary of the object and using the identified boundary of the object to associate geometric information with the object, where the object occupies a field of view greater than 180 degrees.

The rejections of Claims 13-21 and 37 for obviousness rely on Szeliski '747 and Seago '900 for teaching the limitations of Claims 11 and 36 from which these claims depend, respectively. As shown above, neither Szeliski '747 nor Seago '900 teaches modeling an object within a panorama by identifying a boundary of the object and using the identified boundary of the object to associate geometric information with the object, where the object occupies a field of view of more than 180 degrees in the image panoramas. Further, Blank '536 does not provides the teaching, lacking in Szeliski '747 and in Seago '900, of modeling an object where the object occupies a field of view of more than 180 degrees in the image panoramas. Thus, a prima facie case of obviousness cannot be made from any combination of Szeliski '747, Seago '900, and Blank '536 for Claims 11 and 36, because these references do not teach required limitations of these claims. Because Claims 13-21 and 37 depend from Claims 11 and 36, respectively, and add further limitations, Claims 13-21 and 37 are deemed non-obvious over Szeliski '747 in view Seago '900 and Blank '536 for at least the same reasons as for Claim 11 and 36, respectively.

Applicant requests consideration of the newly added claims, reconsideration of all pending claims and a notice of allowance. The Examiner

is requested to telephone the undersigned if any matters remain outstanding so that they may be resolved expeditiously. The Commissioner is hereby authorized to charge any deficiency in the fees filed, asserted to be filed or which should have been filed herewith to our Deposit Account No. 19-4972.

Respectfully submitted,

/John L. Conway, #48,241/

Bromberg & Sunstein LLP
125 Summer Street
Boston, MA 02110-1618
(617) 443-9292

John L. Conway
Registration No. 48,241
Attorney for Applicant

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